We claim:

1   1. A gun control system comprising:

2   a fire control kernal providing core fire control functionality that is unaffected by

3   changes within an environment external to the fire control kernel; and,

4   a plurality of location-independent software components within the fire control

5   kernel, each component having a specific functionality and able to run on any of a

6   plurality of processors in a location-independent manner.

1   2. The gun control system of claim 1, further comprising an infrastructure component

2   underlying the plurality of location-independent software components of the fire control

3   kernel to support the components so that each component is able to operate independently

4   of other components in the location-independent manner.

1   3. The gun control system of claim 1, wherein the plurality of location-independent

2   software components comprises a target/track management interface software component

3   providing access to the fire control kernel for target-related and track-related data.

1   4. The gun control system of claim 3, wherein the target/track management interface

2   software component accepts as input two-dimensional and three-dimensional sensor track

3   data, indirect target data, sensor status data, and target number selection and

4   reassignments.

1   5. The gun control system of claim 3, wherein the target/track management interface

2   software component provides as output sensor designation data, track data requests, and

3   smoothed target state data.

1   6. The gun control system of claim 1, wherein the plurality of location-independent

2   software components comprises a gun control system control interface software

3   component providing for control of kernel processing by a gun control operator and

4   external digital control sources.

1   7. The gun control system of claim 6, wherein the gun control system control interface

2   software component accepts as input engage controls, system doctrine, and gun control

3   operator console input controls and data values.

1   8. The gun control system of claim 6, wherein the gun control system control interface

2   software component provides as output engagement status, engagement order responses,

3   overall system status, and controls of peripheral equipment.

1   9. The gun control system of claim 1, wherein the plurality of location-independent

2   software components comprises a gun mount control interface software component

3   providing access into the fire control kernel for control of a gun mount currently in use.

1   10. The gun control system of claim 9, wherein the gun control mount control interface

2   software component accepts as input gun position and status, gun firing status, and gun

3   ammunition inventory.

1   11. The gun control system of claim 9, wherein the gun control mount control interface

2   software component provides as output deck-reference gun orders and rates, gun mount

3   controls, fire order controls, ammunition controls, and selection orders.

1   12. The gun control system of claim 1, wherein the plurality of location-independent

2   software components comprises an ownship data interface software component providing

3   access into the fire control kernel for ownship state and attitude data needed for general

4   fire control processing.

1   13. The gun control system of claim 12, wherein the ownship data interface software

2   component accepts as input ownship attitude data, ownship speed and course, ownship

3   location, and environmental inputs.

1   14. The gun control system of claim 1, wherein the plurality of location-independent

2   software components comprises a gun control system display interface software

3   component providing access into the fire control kernel for extracting display data for a

4   gun mount currently in use.

1 15. The gun control system of claim 14, wherein the gun control system display interface

2 software component accepts as input console assignment for multiple-console

3 configurations.

1 16. The gun control system of claim 14, wherein the gun control system display interface

2 software component provides as output necessary data to generate one or more fire

3 control displays.

1 17. A gun control system comprising:

2   a fire control kernal providing core fire control functionality that is unaffected by

3 changes within an environment external to the fire control kernel;

4   a target/track management interface software component located within the fire

5 control kernel and providing in a location-independent manner access to the fire control

6 kernel for target-related and track-related data;

7   a gun control system control interface software component located within the fire

8 control kernel and providing in the location-independent manner for control of kernel

9 processing by a gun control operator and external digital control sources;

10   a gun mount control interface software component located within the fire control

11 kernel and providing in the location-independent manner access into the fire control

12 kernel for control of a gun mount currently in use;

13   an ownship data interface software component located within the fire control

14 kernel and providing in the location-independent manner access into the fire control

15 kernel for ownship state and attitude data needed for general fire control processing; and,

16   a gun control system display interface software component located within the fire

17   control kernel and providing in the location-independent manner access into the fire

18   control kernel for extracting display data for a gun mount currently in use.

1   18. The gun control system of claim 17, further comprising an infrastructure component

2   underlying the target/track management interface software component, the gun control

3   system control interface software component, the gun mount control interface software

4   component, the ownship data interface software component, and the gun control system

5   display interface software component so that each component is able to operate

6   independently of other components in the location-independent manner.

1   19. A gun control system comprising:

2   kernel means for providing core fire control functionality that is unaffected by

3   changes within an environment external to the fire control kernel; and,

4   means for providing a specific functionality and located within the kernel means.

1   20. The gun control system of claim 19, further comprising at least one additional means

2   for providing additional specific functionality and located within the kernel means.